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| **Monday** | **Tuesday** | **Wednesday** | **Thursday** | **Friday** |
| Review of Mitosis  Activity  *– demonstrate an understanding of the*  *process and importance of mitosis (e.g., cell division and the phases of mitosis);* | In class investigation (Gizmo of meiosis)  *–explain the process of meiosis, with reference*  *to a computer simulation or to their*  *own investigations with a microscope*  *(e.g., using slides of grasshopper testis,*  *explain what happens in the first and second*  *stages of prophase and metaphase and*  *anaphase 2 in meiosis);* | Consolidation of Gizmo and go over meiosis stages  *–explain the process of meiosis in terms of the replication and movement of chromosomes;* | Sources of variance in meiosis (crossing over, independent assortment) | Dry-Lab  Comparing mitosis and  meiosis (microscope slides and student-created tables)  Self-assessment  *–organize data (e.g., in a table) that illustrate the number of chromosomes in haploid cells and diploid cells, and the number of pairs of chromosomes in diploid cells, that occur in various organisms before, during, and as a result of meiosis;* |
| Gamete formation and  Review for quiz 1 | Quiz 1  In class investigation comparing traits | Origins of genetics (historical case study)  *–describe and explain the process of discovery*  *(e.g., the sequence of studies and the knowledge gained) that led Mendel to formulate his laws of heredity;* | Inheritance of one trait (monohybrid cross; probability)  Exit slip  *–predict the outcome of various genetic crosses.*  *–solve basic genetic problems involving*  *monohybrid crosses, incomplete dominance,*  *co-dominance, dihybrid crosses, and sex-linked genes using the Punnett*  *method;* | Inheritance of two traits (dihybrid cross and test cross)  Exit slip  *-predict the outcome of various genetic crosses.*  *–solve basic genetic problems involving*  *monohybrid crosses, incomplete dominance,*  *co-dominance, dihybrid crosses, and sex-linked genes using the Punnett*  *method;* |
| Incomplete, complete and codominance  *– explain, using Mendelian genetics, the concepts of dominance, co-dominance, incomplete dominance, recessiveness, and*  *sex-linkage;*  *–solve basic genetic problems involving*  *monohybrid crosses, incomplete dominance,*  *co-dominance, dihybrid crosses, and sex-linked genes using the Punnett*  *method;* | Wet Lab -  Blood typing lab  (Remind students about how to write a lab report) | Recessiveness, sex-linkage and introduction to pedigree charts  *–explain how the concepts of DNA, genes, chromosomes, and meiosis account for the*  *transmission of hereditary characteristics from generation to generation (e.g., explain how the sex of an individual can be determined genetically; demonstrate an understanding that the expression of a genetic*  *disorder linked to the sex chromosomes is more common in males than in females);* | Genetic disorders and analysis of pedigree charts  Hand out and go over outline for STSE assignment  *–describe genetic disorders (e.g., Down syndrome,*  *cystic fibrosis,muscular dystrophy, fragile X syndrome) in terms of the chromosomes affected, physical effects, and*  *treatment;* | Karyotypes and meiosis mistakes |
| Work period for STSE assignment (computer lab)  *–research genetic technologies using*  *sources from print and electronic media, and synthesize the information gained*  *(e.g., describe the Human Genome*  *Project, transgenics, or the process of*  *genetic screening; list the advantages and disadvantages of cloning or the genetic manipulation of plants).*  *–summarize the main scientific discoveries*  *of the nineteenth and twentieth centuries*  *that led to the modern concept of the gene (e.g., the discoveries of Hugo de Vries,W.S. Sutton,Thomas Morgan, J. Muller, Barbara McClintock, Rosalind Franklin, James Watson, and Francis Crick);*  *–describe and analyse examples of genetic*  *technologies that were developed on the basis of scientific understanding (e.g., the improvement of an experimental procedure to extract DNA from bacterial or plant cells);*  *– identify and describe examples of*  *Canadian contributions to knowledge*  *about genetic processes (e.g., research into*  *cystic fibrosis) and to technologies and*  *techniques related to genetic processes*  *(e.g., the invention of nuclear magnetic*  *resonance [NMR]).* | Presentations | Presentations | Review | Unit Test |

**Overall Expectations**

By the end of this course, students will:

• demonstrate an understanding of the necessity of meiosis and describe the importance of genes in transmitting hereditary characteristics according to Mendel’s model of inheritance;

• perform laboratory studies of meiosis and analyse the results of genetic research related to the laws of heredity;

• outline the scientific findings and some of the technological advances that led to the modern concept of the gene and to genetic technology, and demonstrate an awareness of some of the social and political issues raised by genetic research and reproductive technology.

**Specific Expectations NOT covered:**

*-compile qualitative and quantitative data from a laboratory investigation on monohybrid and dihybrid crosses, and present the results, either by hand or computer (e.g., record observations using a “Virtual Fly” laboratory software package);*